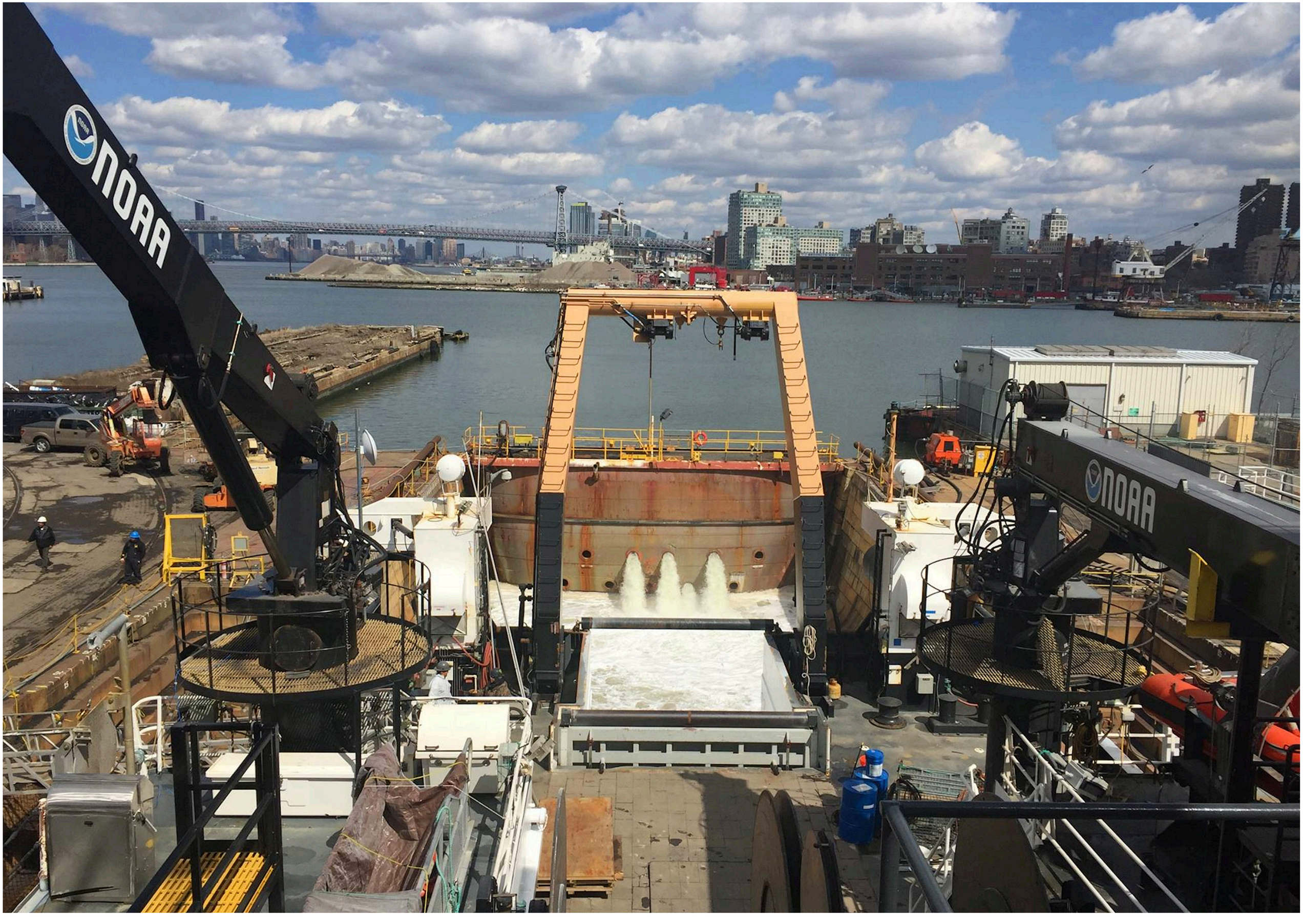

NOAA
NOAA

## GENERAL NOTES

1. ARABIC NUMERALS WITH THE LETTERS "PROJ" ABOVE REPRESENT NAVIGATIONAL DRAFT MARKS. REMAINING ARABIC NUMERALS REPRESENT CALCULATIVE DRAFT MARKS.

2. DIMENSIONS:
   (A) LONGITUDINAL LOCATIONS OF ALL ITEMS ARE GIVEN FROM THE STERN REFERENCE POINT (AFT END OF MAIN DECK AT CENTERLINE).
   (B) HEIGHTS OF ALL ITEMS ARE GIVEN FROM THE BOTTOM OF THE KEEL AMIDSHIPS EXTENDED.
   (C) LONGITUDINAL LOCATIONS AND HEIGHTS OF SIDE BLOCKS ARE TAKEN TO THE AFT SIDE OF BLOCKS.
   (D) REFERENCE DIMENSIONS FOR DOCKING PLUGS ARE TAKEN FROM THEIR CENTER.

3. COMPLETE PAINTING OF HULL:
   (A) IN ORDER TO CLEAN AND PAINT THE ENTIRE BOTTOM OF THE VESSEL IN THREE SUCCESSIVE DOCKINGS. THE FOLLOWING SEQUENCE OF DOCKING POSITIONS OF THE VESSEL ARE NECESSARY:
      (1) POSITION NO. 1
      (2) POSITION NO. 2
      (3) POSITION NO. 3
   (B) REPEAT CYCLE OF POSITIONS. ASCERTAIN FROM VESSEL THE POSITION OF VESSEL AT ITS LAST DOCKING.

4. DIMENSIONS IN THE TABLE OF OFFSETS ARE GIVEN IN MILLIMETERS.

5. KEEL BLOCKS SHALL BE CONFIGURED TO CLEAR DRAIN PLUGS.

6. BLOCKING:
   (A) BLOCKING SHOWN ON THIS PLAN IS THAT REQUIRED FOR BLOCKING UNDER ORDINARY UNDAMAGED CONDITIONS.
   (B) KEEL BLOCKS:
      (1) KEEL BLOCKS SHALL BE ARRANGED IN PIERS CONSISTING OF 914mmx914mmx305mm HARDWOOD TIMBERS MOUNTED WITH 50 MM MIN THICKNESS SOFTWOOD CAP BLOCKS, UNO. LONGITUDINAL SPACING AND ALL OTHER NEEDED INFO IS LISTED IN KEEL BLOCK TABLE OF OFFSETS.
      (2) NO BLOCKS OR SHORES ARE REQUIRED UNDER ORDINARY CONDITIONS OF DOCKING UNDER THE STERN AFT OF FRAME 83.
   (C) SIDE BLOCKS:
      (1) SIDE BLOCKS SHALL BE LOCATED (P) AND (S) UNDER MAJOR TRANSVERSE OR LONGITUDINAL STRUCTURE AT DISTANCES OFF CENTERLINE AS INDICATED ON TABLE OF OFFSETS.
      (2) SOFTWOOD CAPS ARE REQUIRED, 50 MM MIN THICKNESS.
      (3) SIDE BLOCKS ARE NUMBERED FROM AFT TO FORWARD WITH THE MOST AFT BLOCK AS NO. 1.

7. ALLOWABLE BLOCK PRESSURE IS 500 PSI (35.15 KG/CM$^2$).

△4 2 8. VESSEL DISPLACEMENT USED FOR BLOCK BEARING PRESSURES IS 2613.37 MT BASED ON AN EVEN KEEL DRAFT OF 6.2 M.

9. THE CENTERBOARD MUST BE RETRACTED DURING DOCKING EVOLUTIONS.

10. VESSEL MUST BE DOCKED WITHOUT LIST AND EXCESSIVE TRIM. MAXIMUM ALLOWABLE TRIM IS 580 MM.

11. BLOCKS IN EXCESS OF 1829 MM IN HEIGHT SHALL BE STRAPPED TOGETHER USING ANGLES, AND SIDE BLOCKS SHALL BE TIED TOGETHER LONGITUDINALLY WITH STEEL RODS.

12. A HARD CAP IN CONJUNCTION WITH A SOFT WOOD STRATUM BELOW MUST BE USED FOR KEEL BLOCKS 1–4, 16 & 17.

13. DRYDOCK BEARING PRESSURES DERIVED FROM REFERENCE 12 & 13.

14. SIDE BLOCKS IN EXCESS OF 1829 MM IN HEIGHT SHALL HAVE A BASE 3X WIDER AT THE BOTTOM THAN AT THE TOP.

△2 1 15. ADD OUTBOARD BLOCK #1 P/S AFTER VESSEL IS LANDED IF KEEL BLOCK #1 IS NEEDED TO BE REMOVED FOR DRAIN PLUG ACCESS OR PAINTING.

16. KEEL BLOCK #1 TO BE REMOVED AFTER VESSEL IS LANDED FOR PAINTING OR WHEN ACCESS TO DRAIN PLUGS IS NECESSARY.

## CRITICAL DIMENSIONS

| | | |
|---|---|---|
| LENGTH OVERALL | = | 63.57 m |
| LENGTH BETWEEN PERPENDICULARS | = | 58.00 m |
| LENGTH ON DWL | = | 61.00 m |
| BEAM, EXTREME | = | 15.00 m |
| BEAM, ON DWL AT STA OF MAX AREA | = | 15.00 m |
| BEAM, ON DWL AT MIDSHIPS | = | 15.00 m |
| DRAFT, TO DWL, AMIDSHIPS | = | 5.35 m |
| DRAFT, MLD BASELINE TO DWL | = | 5.90 m |
| SLOPE OF KEEL DRAG | = | 1: 37.12 |

BASELINE LOCATED .55 m BELOW MLD KEEL AT MIDSHIPS
COMPLEMENT 39 (TOTAL)

## △7 1 △6 1 △4 1 DISPLACEMENT PROPERTIES

| VESSEL CONDITION | DISPLACEMENT | FWD DRAFT (M) @ FP | MEAN DRAFT (M) @ MIDSHIPS | AFT DRAFT (M) @ AP | VCG (M, ABL) | LCG (AFT OF FP) |
|---|---|---|---|---|---|---|
| LIGHTSHIP (TRIM & STABILITY BOOKLET, REV 1) | 1757.59 | 5.17 | 5.95 | 6.74 | 7.23 | 32.38 |
| VESSEL IN BURNT OUT CONDITION | 2315.76 | 5.31 | 5.73 | 6.14 | 6.98 | 30.30 |
| VESSEL IN DEPARTURE CONDITION | 2543.04 | 6.02 | 6.09 | 6.15 | 6.69 | 29.88 |

## AS-BUILT

△8 1

## PARTS LIST

| ITEM NO. | QTY | SIZE | DESCRIPTION | MATERIAL | SPEC | PART NO. | REMARKS | UNIT WT LBS |
|---|---|---|---|---|---|---|---|---|
| 1 | 6 | EA | ANODE, 2 1/2"x6"x12", BOLT ON | ZINC | TYPE ZHC | – | GALVOTEC OR EQUAL | 42# |
| 2 | 40 | EA | TEARDROP ANODE, MODIFIED TO BOLT ON | ZINC | TYPE ZTS | – | GALVOTEC OR EQUAL | 5# |

## ANODE LOCATING TABLE

| LOCATION | COMPT NUMBER | ANODES REQD | ANODE TYPE | REMARKS |
|---|---|---|---|---|
| CENTERBOARD TRUNK | 4–39–0 | 6 | TYPE ZHC | LOCATE ONE EACH ON FWD AND AFT BHDS, AND TWO EQUALLY SPACED ON LONG'L BHDS |
| RUDDER | – | 8 | TYPE ZTS | LOCATE ON FLAP & LINKAGE |
| BOWTHRUSTER TUNNEL AROUND INLETS | – | 32 | | 4 PER INLET, LOCATED AT QUARTER POINTS AROUND INLET 5 FT MIN FROM IMPELLER |

## RESERVATIONS

△5 1

## DRAWING INDEX

| | |
|---|---|
| 6 | HULL OPENINGS/DISCHARGES & KEEL BLOCK OFFSETS TABLES |
| 5 | SIDE BLOCK OFFSETS & BEARING PRESSURES |
| 4 | BLOCKING ARRANGEMENT–SECTIONS |
| 3 | BLOCKING ARRANGEMENT–PLAN VIEWS |
| 2 | BLOCKING ARRANGEMENT–PLAN & ELEVATION |
| 1A | REVISION SHEET |
| 1 | TITLE SHEET |
| SH | DESCRIPTION |

△9 6

## REFERENCES

| NO. | TITLE | DRAWING NUMBER |
|---|---|---|
| 15 | CRANDALL DRY DOCK ENGINEERS F.D.D. HM1 1–4 | – |
| 14 | THRUSTER INSTALLATION ARRANGEMENT (ELLIOT–VENDOR DWG) | 5104WG |
| 13 | DOCKING INSTRUCTIONS & ROUTINE WORK IN DRYDOCK | NAVSEA 59086-7G-STM-000 |
| 12 | AN INTRODUCTION TO DRYDOCKING PRINCIPLES & TECHNIQUES | – |
| 11 | TRANSDUCER ARRANGEMENTS & INSTALLATION | M282–461–FE93 |
| 10 | OUTBOARD PROFILE | M282–085–FA01 |
| 9 | BILGE KEEL LAYOUT | M282–100–FH54 |
| 8 | MOORING & TOWING FITTINGS–KEY PLAN & FDNS | M282–170–FH28 |
| 7 | IMPRESSED CURRENT CATHODIC PROTECTION ARRG'T & DET | M282–624–FE70 |
| 6 | BOSSING & STERN FRAME SCANTLINGS | M282–110–FH18 |
| 5 | HULL TRANSOM SCANTLINGS, FR 82–TRANSOM | M282–100–FH05 |
| 4 | HULL STERNBODY SCANTLINGS, FR 49–82 | M282–110–FH04 |
| 3 | HULL MIDBODY SCANTLINGS, FR 19–49 | M282–110–FH03 |
| 2 | HULL FOREBODY SCANTLINGS, FR 0–18 | M282–100–FH02 |
| 1 | GENERAL ARRANGEMENT | M282–085–FA02 |

## DOCUMENT DISTRIBUTION RECORD

| DATE IN ROOM | 10/31/03 | 5/28/04 | 7/15/04 | 9/30/04 | 5/1/05 | 4/19/06 | 5/9/06 | 7/11/06 | 7/25/06 | 6/21/11 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISSUE DATE | 11/3/03 | 6/2/04 | 7/20/04 | 10/4/04 | 5/3/05 | 4/28/06 | 5/9/06 | 7/13/06 | | | | | | |
| REV# | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | | |
| PROJECT ENG | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | |
| PROJECT MGR | 1 | 1 | 1 | 1 | 1 | 1 | | | | 1 | | | | |
| ABS | | | | | | | | | | | | | | |
| USPH | | | | | | | | | | | | | | |
| USCG | | | | | | | | | | | | | | |
| HMP PC | 12 | 12 | 12 | 12 | 12 | 12 | 1 | 1 | 1 | | | | | |
| PROD DESIGN GROUP | 1(3) | (3) | (3) | (3) | (3) | | | | | | | | | |
| HULL MGR | | | | | | | | | | | | | | |
| HULL LEAD | (1) | (1) | (1) | (1) | (1) | (1) | 1 | 1 | 1 | | | | | |
| HVAC | | | | | | | | | | | | | | |
| JOINER | | | | | | | | | | | | | | |
| HPG PC | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | | | | | |
| NOISE CONT | | | | | | | | | | | | | | |
| CHAND, LLC | 1 | 1 | 1 | 1 | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ISSUED BY | AE | AE | AE | AE | AE | SM | SM | SM | SM | | | | | |

## REVISIONS

| REV | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| 1 | | 1. SH 2, ELEV. 13–A: ADDED TRANSDUCER APPENDAGE AFT OF KEEL BLOCK #15. CORRECTED ELEVATION CALLOUT FROM "13–C" TO "13–A".<br>2. SH 2, PLAN 13–C: CORRECTED LOCATION AND SHAPE OF TRANSDUCER APPENDAGE. SPLIT KEEL BLOCK #15 TO PORT AND STARBOARD LOCATIONS, 580 OCL, TO CLEAR TRANSDUCER APPENDAGE. CORRECTED PLAN CALLOUT FROM "13–A" TO 13–C".<br>3. SH 3, PLAN 20–A: CORRECTED LOCATION AND SHAPE OF TRANSDUCER APPENDAGE. REVISED KEEL BLOCK #15 TO MATCH BLOCK POSITION #2.<br>4. SH 3, PLAN 20–C: CORRECTED LOCATION AND SHAPE OF TRANSDUCER APPENDAGE.<br>5. SH 6, TABLE FOR KEEL BLOCK NO. 1–17: REVISED BLOCK BEARING PRESSURES FOR BLOCK #15, POSITION 1, FROM 1.755 TO 0.878. REVISED LONGITUDINAL LOCATION AND HEIGHTS FOR BLOCK #15, POSITION 3, TO SUIT RELOCATION TO CLEAR TRANSDUCER.<br>ITEMS 1 – 5 PER ENGINEERING DEVELOPMENT | 5/27/04 RMW | 5/31/04 RG |
| 2 | | 1. SH 1, GENERAL NOTES: ADDED GENERAL NOTES 15 AND 16.<br>2. SH 2, ELEVATION 13–A: REVISED LOCATION OF SONAR TRANSDUCER FROM FRAME 25 TO FRAME 23. DELETED KEEL BLOCK #15.<br>3. SH 2, PLAN 13–C: REVISED LOCATION OF SONAR TRANSDUCER FROM FRAME 25 TO FRAME 23; RENAMED INBOARD BLOCK #3 TO #4 AND ADDED NEW INBOARD BLOCK #3; ADDED NOTE REGARDING OPTIONAL USE OF OUTBD BLOCKS 1–3 P/S.<br>4. SH 3, PLAN 20–A: REVISED LOCATION OF SONAR TRANSDUCER FROM FRAME 25 TO FRAME 23; RENAMED INBOARD BLOCK #3 TO #4 AND ADDED NEW INBOARD BLOCK #3; ADDED NOTE REGARDING OPTIONAL USE OF OUTBD BLOCKS 1–3 P/S; ADDED REFERENCE TO G.N. 15 TO KEEL BLOCK #1 AND OUTBD BLOCK #1<br>5. SH 3, PLAN 20–C: REVISED LOCATION OF SONAR TRANSDUCER FROM FRAME 25 TO FRAME 23; RENAMED INBOARD BLOCK #3 TO #4 AND ADDED NEW INBOARD BLOCK #3; ADDED NOTE REGARDING OPTIONAL USE OF OUTBD BLOCKS 1–3 P/S;<br>6. SH 5, TABLES FOR SIDE BLOCK POSITION 1– 3: REVISED BEARING PRESSURES PER BLOCK TO SUIT KEEL BLOCK 15 DELETION; PROVIDED OPTION TO USE OUTBOARD BLOCKS 1 THRU 3 EXCEPT AS NOTED.<br>7. SH 6, TABLE FOR KEEL BLOCK 1–17: DELETED KEEL BLOCK 15 FROM TABLE TO CLEAR TRANSDUCER INTERFERENCE; ADDED REFERENCES TO GN 15 AND 16 TO KEEL BLOCK 1; REVISED BEARING PRESSURES PER TO SUIT KEEL BLOCK DELETION.<br>ITEMS 1 – 7 PER M282 REWORK #701–0002 | 7/15/04 RMW | 7/16/04 RG |
| 3 | | 1. SH 2, PLAN 13–C: DELETED ALL OUTBOARD SIDE BLOCKS; RELOCATED INBOARD SIDE BLOCK #3 FROM 27 TO FRAME 30.<br>2. SH 3, PLAN 20–C: DELETED ALL OUTBOARD SIDE BLOCKS EXCEPT FOR OUTBLOCK #1; RELOCATED INBOARD SIDE BLOCK #3 FROM 23 TO FRAME 27.<br>3. SH 3, PLAN 20–A: DELETED ALL OUTBOARD SIDE BLOCKS EXCEPT FOR OUTBLOCK #1; ADDED INBOARD SIDE BLOCK #5 AT FRAME 19, 1587 OCL.<br>4. SH 4, SECTION 20–A: DELETED OUTBOARD SIDE BLOCKS.<br>5. SH 4, SECTION 23–A: DELETED OUTBOARD SIDE BLOCKS.<br>6. SH 5, SIDE BLOCK POSITION NO. 1 TABLE: DELETED OUTBOARD BLOCKS 1 THRU 6; CHANGED LOCATION OF INBOARD BLOCK #3; REVISED BEARING PRESSURES TO SUIT NEW BLOCK ARRANGEMENT; CORRECTED BLOCK HEIGHTS; ADDED BLOCK MIDSPAN HEIGHT.<br>7. SH 5, SIDE BLOCK POSITION NO. 2 TABLE: DELETED OUTBOARD BLOCKS 2 THRU 6; CHANGED LOCATION OF ALL INBOARD BLOCKS; REVISED BEARING PRESSURES TO SUIT NEW BLOCK ARRANGEMENT; CORRECTED BLOCK HEIGHTS; ADDED BLOCK MIDSPAN HEIGHT.<br>8. SH 5, SIDE BLOCK POSITION NO. 3 TABLE: DELETED OUTBOARD BLOCKS 2 THRU 6; CHANGED LOCATION OF ALL INBOARD BLOCKS; REVISED BEARING PRESSURES TO SUIT NEW BLOCK ARRANGEMENT; CORRECTED BLOCK HEIGHTS; ADDED BLOCK MIDSPAN HEIGHT.<br>9. SH 6, TABLE FOR KEEL BLOCK: REVISED BEARING PRESSURES TO SUIT NEW BLOCK LAYOUTS.<br>ITEMS 1 – 9 PER M279 TRIAL CARD 1 B 001 OP 01 (M279). | 9/23/04 RMW | 10/29/04 RMW |
| 4 | | 1. SH 1, DISPLACEMENT PROPERTIES: REVISED DISPLACEMENTS TO SUIT WEIGHT ESTIMATE REPORT #5.<br>2. SH 1, GENERAL NOTES: REVISED GENERAL NOTE 8 DISPLACEMENT USED IN BLOCK CALCULATIONS FROM 2440.97 MT TO 2613.37 MT TO SUIT INCREASES IN DISPLACEMENT FROM ECP'S.<br>3. SH 2, PLAN 13–C: RENAMED INBOARD BLOCKS #1 THRU #4 TO #3 THRU #6, RESPECTIVELY. ADDED NEW INBOARD BLOCKS #1 AND 2 AFT OF EXISTING INBOARD BLOCKS.<br>4. SH 3, PLAN 20–C: RENAMED INBOARD BLOCKS #1 THRU #4 TO #3 THRU #6, RESPECTIVELY. ADDED NEW INBOARD BLOCKS #1 AND 2 AFT OF EXISTING INBOARD BLOCKS.<br>4. SH 3, PLAN 20–A: RENAMED INBOARD BLOCKS #1 THRU #5 TO #3 THRU #7, RESPECTIVELY. ADDED NEW INBOARD BLOCKS #1 AND 2 AFT OF EXISTING INBOARD BLOCKS.<br>5. SH 5, SIDE BLOCK TABLES (ALL): REFORMATTED AND REVISED TABLES TO SUIT ADDITION OF NEW INBOARD BLOCKS.<br>6. SH 6, TABLE FOR KEEL BLOCKS: REVISED BEARING PRESSURE COLUMN TO SUIT BLOCK ADDITIONS.<br>7. SH 1: EXTENDED HULL APPLICABILITY TO INCLUDE HULL 1956.<br>ITEMS 1 THRU 6 PER ECP 0083.<br>ITEM 7 PER ENGINEERING DEVELOPMENT | 4/6/05 AGE | 5/3/05 RG |

This drawing, design concept and specifications are the property of VT Halter Marine, Inc. and are furnished on a confidential basis with an expressed understanding that they will not be copied in any manner, used for manufacture, sold, transferred, nor used to the detriment of said firm without written permission. The recipient further agrees not to disclose these contents hereof to any other parties except for those specific purposes for which this drawing was issued.

VT Halter Marine, Inc.
Vision Technologies Systems

| | | | |
|---|---|---|---|
| DRAWN BY WH 10/27/03 | ABS APPV | | |
| CHECKED BY AGE 10/29/03 | USCG APPV | | |
| APPROVED BY RG 10/30/03 | OWNER APPV | | |
| HULL NO 1953 | CAGE CODE 3B213 | SIZE D | |
| ESTIMATE NO 00–104 | SCALE NONE | | |

VESSEL: FRV40 CLASS 63m FISHERIES RESEARCH VESSEL

TITLE: DOCKING DRAWING

| JOB NO. | ITEM | DELIVERABLE | SHEET | REV |
|---|---|---|---|---|
| M282 | 085 | FA04 | 001 | 09 |

FILE R:\M282\FUNCTIONALDESIGN\WORK\HULLDWGS — SHEET 1 OF 6

DWG NO. M282–085–FA04 SH 1

PLOT: 1=1

## REVISIONS

| REV | ZONE | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| 5 | | 1. ADDED SH 1A TO TO DRAWING INDEX AND REVISION STATUS.<br><br>2. SH 2 & 3, HULL PENETRATION ADDED FOR SONAR SYSTEMS.<br><br>ITEM 1 THRU 2 PER ECP 093 | 4/19/06<br>MDP | 4/28/06<br>SM |
| 6 | | 1. SH 1, DISPLACEMENT PROPERTIES: REVISED DISPLACEMENTS TO SUIT HULL 1953 TRIM & STABILITY BOOKLET REV 0.<br><br>2. REMOVED HULL 1956 FROM HULL APPLICABILITY.<br><br>ITEM 1 & 2 PER ENGINEERING DEVELOPMENT | 5/9/06<br>MDP | 5/9/06<br>SM |
| 7 | | 1. SH 1, DISPLACEMENT PROPERTIES: REVISED DISPLACEMENTS TO SUIT HULL 1953 TRIM & STABILITY BOOKLET REV 1.<br><br>ITEM 1 PER ENGINEERING DEVELOPMENT | 7/11/06<br>MDP | 7/13/06<br>SM |
| 8 | | 1. SH 1, ADDED "AS-BUILT" STAMP, APPLICABLE TO M282 ONLY.<br><br>ITEM 1 PER ENGINEERING DEVELOPMENT | 7/25/06<br>MDP | |
| 9 | 13-C<br><br>VAR<br><br>26-C<br>VAR<br>56-D | 1. SH 2. BLOCK POS. #1 (PLAN 13-C) – REMOVED #2 IB, MOVED #1 IB TO FR. 49 @ 5000 OCL.<br><br>2. SH 3. BLOCK POS. #2 (PLAN 21-C) – REMOVED #2 IB, MOVED #1 IB TO FR. 44 @ 5000 OCL. BLOCK POS. #3 (PLAN 21-A) – REMOVED #2 IB, MOVED #1 IB TO FR. 49 @ 5000 OCL.<br><br>3. SH 4. ADDED SECTION VIEW OF FR. 49 TO REFLECT CHANGE.<br><br>4. SH 5. UPDATED SIDE BLOCK OFFSETS TABLES TO REFLECT CHANGES.<br><br>5. SH 6. UPDATED KEEL BLOCK OFFSETS TABLE TO REFLECT CHANGES.<br><br>6. SH 1. ADDED REFERENCE 15 TO REFERENCES TABLE.<br><br>ITEMS 1-6 PER ENGINEERING DEVELOPMENT. | 6/20/11<br>RCH | |

DWG NO. M282-085-FA04 SH 1

### HULL APPLICABILITY

M282 HULL 1953 (△2 6) (△7 4)

| REV | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 1 |
|---|---|---|---|---|---|---|---|---|
| SHT | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1A | 1 |

REVISION STATUS

DRL NUMBERS

This drawing, design concept and specifications are the property of VT Halter Marine, Inc. and are furnished on a confidential basis with an expressed understanding that they will not be copied in any manner, used for manufacture, sold, transferred, nor used to the detriment of said firm without written permission. The recipient further agrees not to disclose these contents hereof to any other parties except for those specific purposes for which this drawing was issued.

**VT Halter Marine, Inc.**
Vision Technologies Systems

| | |
|---|---|
| DRAWN BY WH 10/27/03 | ABS APPV |
| CHECKED BY AGE 10/29/03 | USCG APPV |
| APPROVED BY RG 10/30/03 | OWNER APPV |

| HULL NO | CAGE CODE | SIZE |
|---|---|---|
| 1953 | 3B213 | D |
| ESTIMATE NO | SCALE | |
| 00-104 | NONE | |

VESSEL: FRV40 CLASS 63m FISHERIES RESEARCH VESSEL

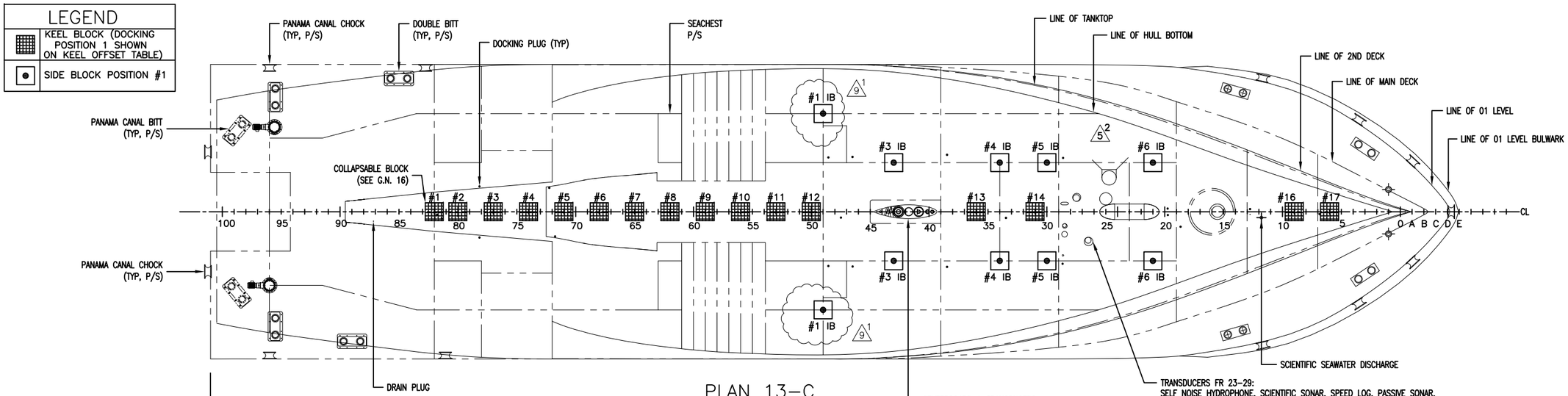
TITLE: DOCKING DRAWING

| JOB NO. | ITEM | DELIVERABLE | SHEET | REV |
|---|---|---|---|---|
| M282 | 085 | FA04 | 001A | 09 |

FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWGS | SHEET 1A OF 6

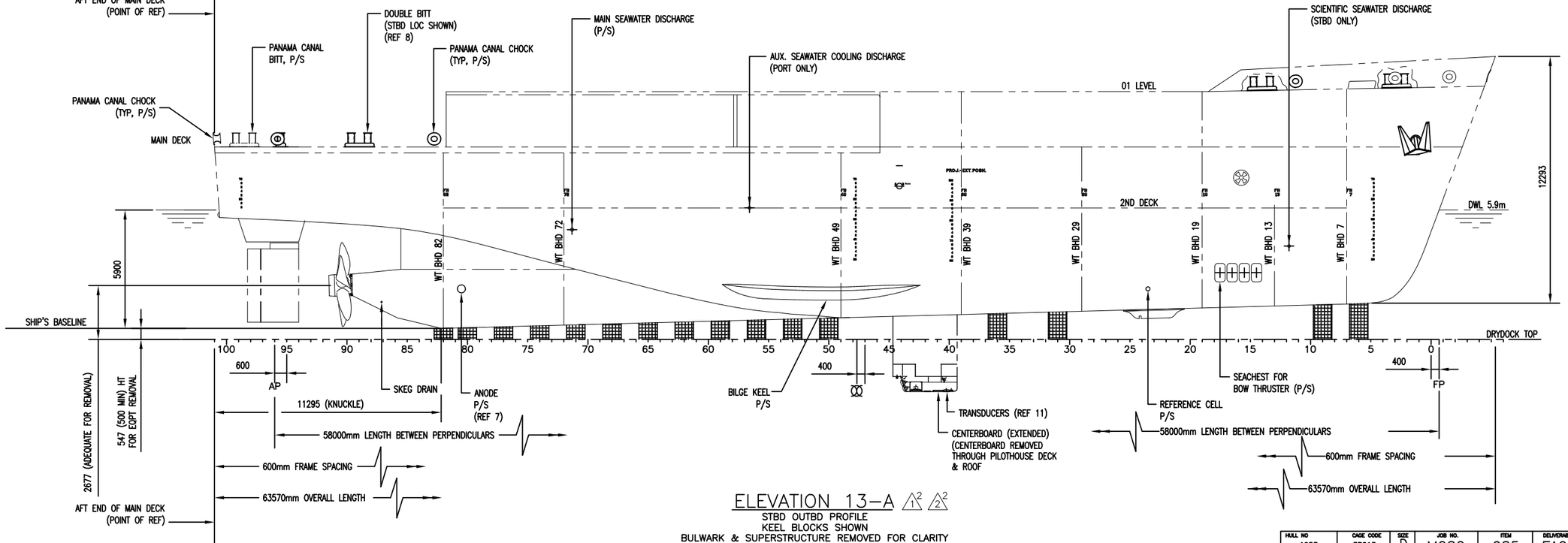
PLOT: 1=1

| LEGEND | |
|---|---|
| | KEEL BLOCK (DOCKING POSITION 1 SHOWN ON KEEL OFFSET TABLE) |
| | SIDE BLOCK POSITION #1 |


PANAMA CANAL CHOCK (TYP, P/S)
DOUBLE BITT (TYP, P/S)
DOCKING PLUG (TYP)
SEACHEST P/S
LINE OF TANKTOP
LINE OF HULL BOTTOM
LINE OF 2ND DECK
LINE OF MAIN DECK
LINE OF 01 LEVEL
LINE OF 01 LEVEL BULWARK
PANAMA CANAL BITT (TYP, P/S)
COLLAPSABLE BLOCK (SEE G.N. 16)
#1 IB
#3 IB
#4 IB
#5 IB
#6 IB
#1 #2 #3 #4 #5 #6 #7 #8 #9 #10 #11 #12 #13 #14 #16 #17
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 A B C D E
CL
PANAMA CANAL CHOCK (TYP, P/S)
DRAIN PLUG
SCIENTIFIC SEAWATER DISCHARGE
TRANSDUCERS FR 23-29:
SELF NOISE HYDROPHONE, SCIENTIFIC SONAR, SPEED LOG, PASSIVE SONAR, SHIPS DEPTH FINDING, ELECTROMAGNETIC SPEED LOG, FISH FINDING, MULTI-BEAM ECHO SOUNDER-90 khz, MULTI BEAM ECHO SOUNDER TRANSMITTER
CENTERBOARD & TRANSDUCERS:
ACOUSTIC RELEASE, ACOUSTIC NET MENSURATION, ACOUSTIC NET MEN-SURATION HYDROPHONE, ACOUSTIC DOPPLER CURRENT PROFILER, SPARE X-DUCER, SCIENTIFIC SONAR, SELF NOISE HYDROPHONE

## PLAN 13-C
## BLOCK POSITION #1

STRUCTURE SHOWN FROM BOTTOM SHELL ONLY
(REF 2-6)




## ELEVATION 13-A

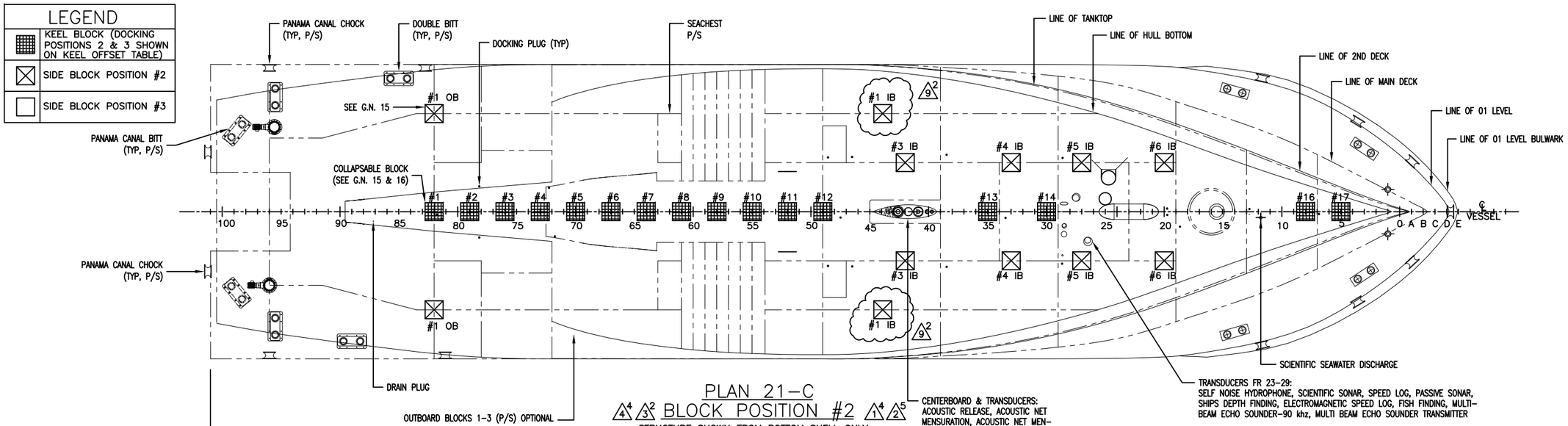
STBD OUTBD PROFILE
KEEL BLOCKS SHOWN
BULWARK & SUPERSTRUCTURE REMOVED FOR CLARITY
(REF 10)

DWG NO. M282-085-FA04 SH 2

| HULL NO | CAGE CODE | SIZE | JOB NO. | ITEM | DELIVERABLE | SHEET | REV |
|---|---|---|---|---|---|---|---|
| 1953 | 3B213 | D | M282 | 085 | FA04 | 002 | 09 |
| ESTIMATE NO | SCALE | | FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWG | | | SHEET 2 OF 6 | |
| 00-104 | 1:100 | | | | | | |

PLOT: 1=100

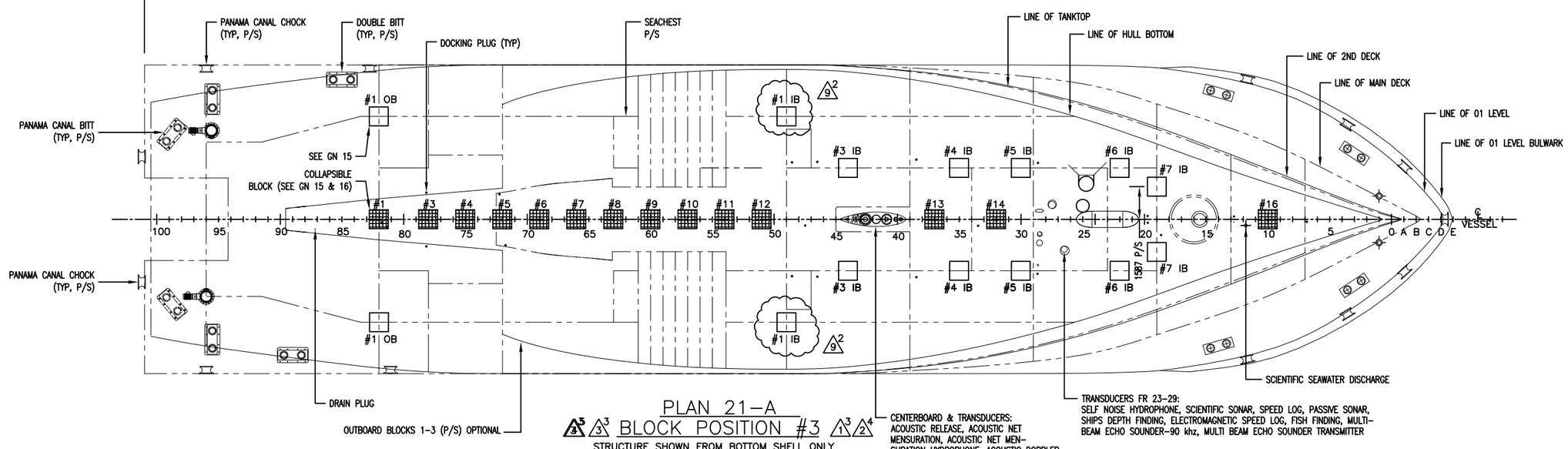
| LEGEND | |
|---|---|
| | KEEL BLOCK (DOCKING POSITIONS 2 & 3 SHOWN ON KEEL OFFSET TABLE) |
| | SIDE BLOCK POSITION #2 |
| | SIDE BLOCK POSITION #3 |


PANAMA CANAL CHOCK (TYP, P/S)
DOUBLE BITT (TYP, P/S)
DOCKING PLUG (TYP)
SEACHEST P/S
LINE OF TANKTOP
LINE OF HULL BOTTOM
LINE OF 2ND DECK
LINE OF MAIN DECK
LINE OF 01 LEVEL
LINE OF 01 LEVEL BULWARK
SEE G.N. 15
#1 OB
#1 IB
#3 IB
#4 IB
#5 IB
#6 IB
PANAMA CANAL BITT (TYP, P/S)
COLLAPSABLE BLOCK (SEE G.N. 15 & 16)
#1 #2 #3 #4 #5 #6 #7 #8 #9 #10 #11 #12 #13 #14 #16 #17
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0
A B C D E
℄ VESSEL
PANAMA CANAL CHOCK (TYP, P/S)
DRAIN PLUG
OUTBOARD BLOCKS 1-3 (P/S) OPTIONAL
SCIENTIFIC SEAWATER DISCHARGE
TRANSDUCERS FR 23-29:
SELF NOISE HYDROPHONE, SCIENTIFIC SONAR, SPEED LOG, PASSIVE SONAR, SHIPS DEPTH FINDING, ELECTROMAGNETIC SPEED LOG, FISH FINDING, MULTI-BEAM ECHO SOUNDER-90 khz, MULTI BEAM ECHO SOUNDER TRANSMITTER
CENTERBOARD & TRANSDUCERS:
ACOUSTIC RELEASE, ACOUSTIC NET MENSURATION, ACOUSTIC NET MENSURATION HYDROPHONE, ACOUSTIC DOPPLER CURRENT PROFILER, SPARE X-DUCER, SCIENTIFIC SONAR, SELF NOISE HYDROPHONE
AFT END OF MAIN DECK (POINT OF REF)

PLAN 21-C

BLOCK POSITION #2

STRUCTURE SHOWN FROM BOTTOM SHELL ONLY
(REF 2-6)


PANAMA CANAL CHOCK (TYP, P/S)
DOUBLE BITT (TYP, P/S)
DOCKING PLUG (TYP)
SEACHEST P/S
LINE OF TANKTOP
LINE OF HULL BOTTOM
LINE OF 2ND DECK
LINE OF MAIN DECK
LINE OF 01 LEVEL
LINE OF 01 LEVEL BULWARK
#1 OB
#1 IB
SEE GN 15
#3 IB
#4 IB
#5 IB
#6 IB
#7 IB
PANAMA CANAL BITT (TYP, P/S)
COLLAPSIBLE BLOCK (SEE GN 15 & 16)
#1 #3 #4 #5 #6 #7 #8 #9 #10 #11 #12 #13 #14 #16
100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0
A B C D E
℄ VESSEL
187' P/S
PANAMA CANAL CHOCK (TYP, P/S)
DRAIN PLUG
OUTBOARD BLOCKS 1-3 (P/S) OPTIONAL
SCIENTIFIC SEAWATER DISCHARGE
TRANSDUCERS FR 23-29:
SELF NOISE HYDROPHONE, SCIENTIFIC SONAR, SPEED LOG, PASSIVE SONAR, SHIPS DEPTH FINDING, ELECTROMAGNETIC SPEED LOG, FISH FINDING, MULTI-BEAM ECHO SOUNDER-90 khz, MULTI BEAM ECHO SOUNDER TRANSMITTER
CENTERBOARD & TRANSDUCERS:
ACOUSTIC RELEASE, ACOUSTIC NET MENSURATION, ACOUSTIC NET MENSURATION HYDROPHONE, ACOUSTIC DOPPLER CURRENT PROFILER, SPARE X-DUCER, SCIENTIFIC SONAR, SELF NOISE HYDROPHONE

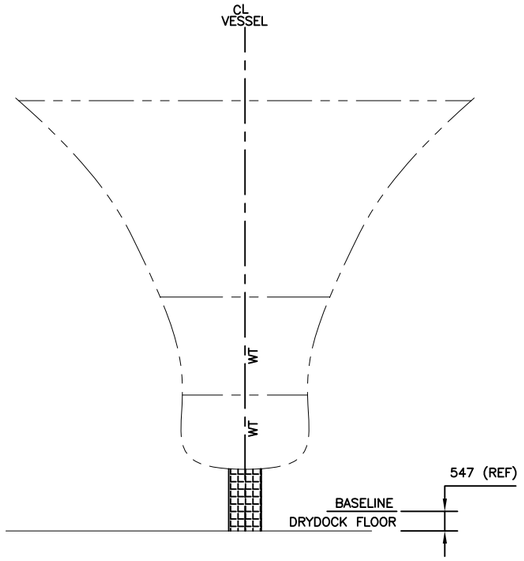
PLAN 21-A

BLOCK POSITION #3

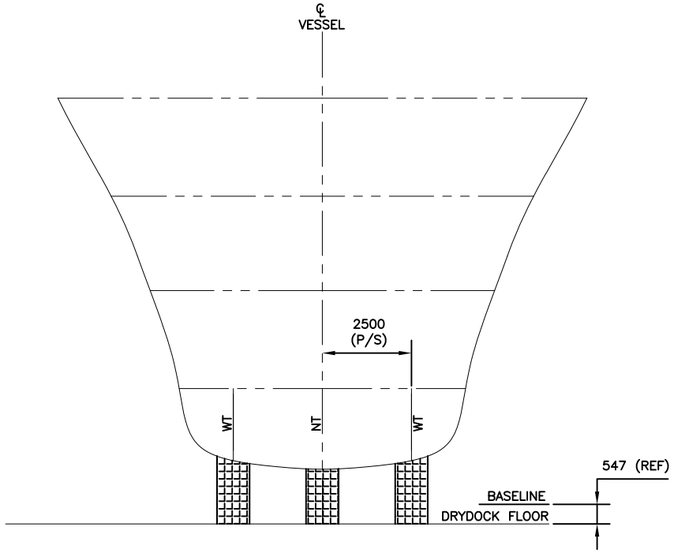
STRUCTURE SHOWN FROM BOTTOM SHELL ONLY
(REF 2-6)

DWG NO. M282-085-FA04 SH 3

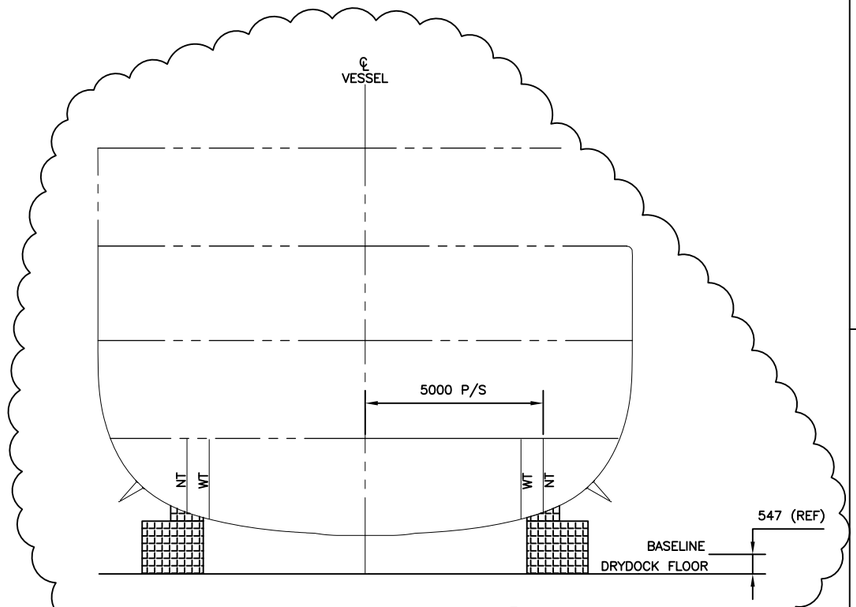
| HULL NO | CAGE CODE | SIZE | JOB NO. | ITEM | DELIVERABLE | SHEET | REV |
|---|---|---|---|---|---|---|---|
| 1953 | 3B213 | D | M282 | 085 | FA04 | 003 | 09 |
| ESTIMATE NO | SCALE | | FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWG | | | SHEET 3 OF 6 | |
| 00-104 | 1:100 | | | | | | PLOT: 1=100 |



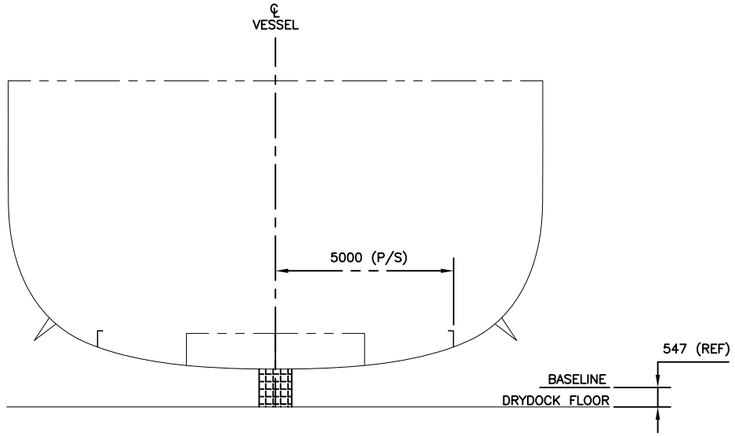

SECTION 31–C
FR 9 LKG FWD



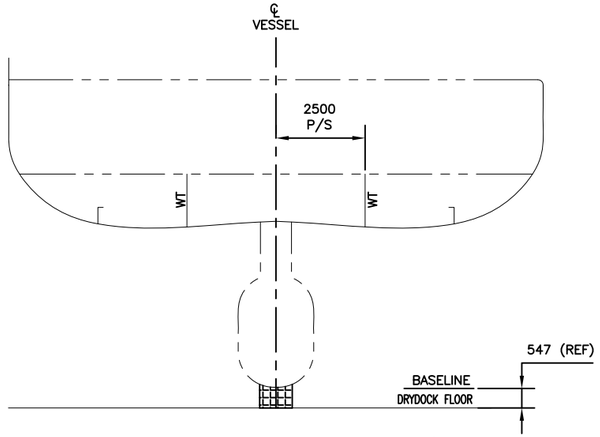

SECTION 29–C
FR 21 NT LKG FWD



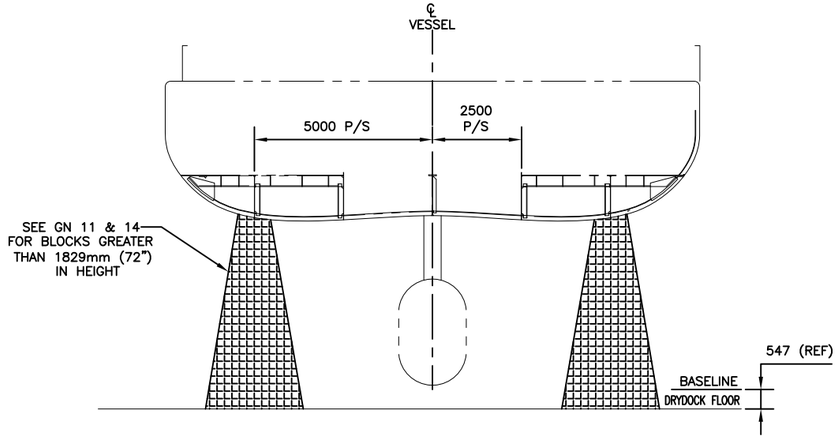

SECTION 26–C 9/3
BHD 49 LKG FWD




SECTION 31–A 3/5
FR 50 LKG FWD




SECTION 29–A 3/4
FR 80 LKG FWD




SECTION 26–A
FR 83 LKG FWD

| HULL NO | CAGE CODE | SIZE | JOB NO. | ITEM | DELIVERABLE | SHEET | REV |
|---|---|---|---|---|---|---|---|
| 1953 | 3B213 | D | M282 | 085 | FA04 | 04 | 09 |
| ESTIMATE NO | SCALE | | | | | | |
| 00–104 | 1:75 | | | | | | |

FILE R:\M282\FUNCTIONAL DESIGN\IN WORK\HULDWG\FA04_004_03.DWG SHEET 4 OF 6

PLOT: 1=75

DWG NO. M282–085–FA04 SH 4

## SIDE BLOCK POSITION NO. 1 △2 6 △3 6 △4 5 △9 4

| BLOCK NUMBER | HEIGHTS ABOVE HULL BASELINE (ADD HEIGHT OF KEEL BLOCK #1 TO OBTAIN TOTAL HT) | | | | | | LOCATION (CTR OF BLOCK) FWD OF AFT REF POINT (mm) | BEARING PRESSURES PER BLOCK ($KG/CM^2$) |
|---|---|---|---|---|---|---|---|---|
| | AFT INBD CORNER | AFT MIDSPAN PT | AFT OUTBD CORNER | FWD INBD CORNER | FWD MIDSPAN PT | FWD OUTBD CORNER | | |
| #1 IB | 1019 | 1166 | 1359 | 1031 | 1173 | 1361 | 31200 | 7.74 |
| #2 IB | | | | | | | | |
| #3 IB | 693 | 733 | 785 | 718 | 757 | 809 | 34800 | 12.42 |
| #4 IB | 849 | 892 | 948 | 878 | 922 | 981 | 40200 | 4.47 |
| #5 IB | 926 | 973 | 1036 | 956 | 1005 | 1072 | 42600 | 7.99 |
| #6 IB | 1117 | 1192 | 1308 | 1154 | 1242 | 1385 | 48000 | 14.14 |

## SIDE BLOCK POSITION NO. 2 △2 6 △3 7 △4 5 △9 4

| BLOCK NUMBER | HEIGHTS ABOVE HULL BASELINE (ADD HEIGHT OF KEEL BLOCK #1 TO OBTAIN TOTAL HT) | | | | | | LOCATION (CTR OF BLOCK) FWD OF AFT REF POINT (mm) | BEARING PRESSURES PER BLOCK ($KG/CM^2$) |
|---|---|---|---|---|---|---|---|---|
| | AFT INBD CORNER | AFT MIDSPAN PT | AFT OUTBD CORNER | FWD INBD CORNER | FWD MIDSPAN PT | FWD OUTBD CORNER | | |
| #1 OB | 4728 | 4787 | 4888 | 4553 | 4619 | 4728 | 11400 | SEE G.N. 15 |
| #1 IB | 1086 | 1239 | 1444 | 1121 | 1284 | 1505 | 34200 | 7.21 |
| #2 IB | | | | | | | | |
| #3 IB | 709 | 749 | 800 | 734 | 774 | 825 | 35400 | 8.81 |
| #4 IB | 868 | 912 | 969 | 897 | 942 | 1003 | 40800 | 4.31 |
| #5 IB | 985 | 1038 | 1109 | 1017 | 1073 | 1151 | 44400 | 7.61 |
| #6 IB | 1141 | 1224 | 1356 | 1179 | 1278 | 1452 | 48600 | 12.39 |

## SIDE BLOCK POSITION NO. 3 △2 6 △3 8 △4 5 △9 4

| BLOCK NUMBER | HEIGHTS ABOVE HULL BASELINE (ADD HEIGHT OF KEEL BLOCK #1 TO OBTAIN TOTAL HT) | | | | | | LOCATION (CTR OF BLOCK) FWD OF AFT REF POINT (mm) | BEARING PRESSURES PER BLOCK ($KG/CM^2$) |
|---|---|---|---|---|---|---|---|---|
| | AFT INBD CORNER | AFT MIDSPAN PT | AFT OUTBD CORNER | FWD INBD CORNER | FWD MIDSPAN PT | FWD OUTBD CORNER | | |
| #1 OB | 4728 | 4787 | 4888 | 4553 | 4619 | 4728 | 11400 | SEE G.N. 15 |
| #1 IB | 1022 | 1169 | 1362 | 1031 | 1173 | 1361 | 31200 | 7.82 |
| #2 IB | | | | | | | | |
| #3 IB | 677 | 717 | 769 | 701 | 741 | 793 | 34200 | 12.65 |
| #4 IB | 831 | 872 | 927 | 859 | 902 | 959 | 39600 | 4.78 |
| #5 IB | 926 | 973 | 1036 | 956 | 1005 | 1072 | 42600 | 8.82 |
| #6 IB | 1094 | 1163 | 1266 | 1130 | 1208 | 1332 | 47400 | 9.07 |
| #7 IB | 1054 | 1103 | 1166 | 1096 | 1133 | 1206 | 49200 | 9.07 |

DWG NO. M282-085-FA04 SH 5

| HULL NO | CAGE CODE | SIZE | JOB NO. | ITEM | DELIVERABLE | SHEET | REV |
|---|---|---|---|---|---|---|---|
| 1953 | 38213 | D | M282 | 085 | FA04 | 005 | 09 |
| ESTIMATE NO | SCALE | | FILE: R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWG | | | SHEET 5 OF 6 | |
| 00-104 | NONE | | | | | | |

PLOT: 1=1

| TABLE FOR KEEL BLOCK NO. 1–17 | | | | | △2 7 △3 9 △4 6 △5 9 |
|---|---|---|---|---|---|
| BLK NO | DOCKING POSITION NO | AFT SIDE OF BLOCK FROM AFT REF PT (mm) | HEIGHT OF BLOCK (AFT SIDE (mm) | HEIGHT OF BLOCK (FWD SIDE (mm) | BEARING PRESSURE PER BLOCK (KG/CM$^2$) |
| 1 | 1 | 10945 | 633 | 565 | SEE GN 16 |
| | 2 | 10945 | 633 | 565 | 21.88 (SEE GN 16) |
| | 3 | 10945 | 633 | 565 | 26.77 (SEE GN 16) |
| 2 | 1 | 12145 | 570 | 594 | 14.55 |
| | 2 | 12755 | 586 | 610 | 15.31 |
| | 3 | | | | |
| 3 | 1 | 13945 | 618 | 642 | 18.82 |
| | 2 | 14555 | 634 | 658 | 17.84 |
| | 3 | 13336 | 601 | 625 | 17.41 |
| 4 | 1 | 15745 | 665 | 689 | 18.26 |
| | 2 | 16355 | 682 | 706 | 17.32 |
| | 3 | 15136 | 649 | 673 | 16.99 |
| 5 | 1 | 17545 | 714 | 738 | 17.69 |
| | 2 | 18155 | 730 | 754 | 16.80 |
| | 3 | 16936 | 697 | 721 | 16.58 |
| 6 | 1 | 19345 | 762 | 786 | 17.13 |
| | 2 | 19955 | 778 | 802 | 16.28 |
| | 3 | 18736 | 745 | 769 | 16.17 |
| 7 | 1 | 21145 | 810 | 834 | 16.56 |
| | 2 | 21755 | 826 | 850 | 15.75 |
| | 3 | 20536 | 793 | 817 | 15.75 |
| 8 | 1 | 22945 | 857 | 882 | 16.00 |
| | 2 | 23555 | 874 | 898 | 15.23 |
| | 3 | 22336 | 841 | 865 | 15.34 |
| 9 | 1 | 24745 | 905 | 929 | 15.43 |
| | 2 | 25355 | 922 | 946 | 14.71 |
| | 3 | 24136 | 889 | 913 | 14.93 |
| 10 | 1 | 26545 | 953 | 977 | 14.87 |
| | 2 | 27155 | 970 | 994 | 14.19 |
| | 3 | 25936 | 937 | 961 | 14.51 |
| 11 | 1 | 28345 | 1002 | 1026 | 14.30 |
| | 2 | 28955 | 1018 | 1042 | 13.66 |
| | 3 | 27736 | 985 | 1009 | 14.10 |
| 12 | 1 | 30145 | 1051 | 1075 | 9.22 |
| | 2 | 30755 | 1067 | 1091 | 17.40 |
| | 3 | 29536 | 1034 | 1058 | 11.41 |
| 13 | 1 | 38545 | 1275 | 1299 | 18.96 |
| | 2 | 39155 | 1292 | 1316 | 16.31 |
| | 3 | 37936 | 1259 | 1283 | 17.84 |
| 14 | 1 | 41545 | 1357 | 1381 | 6.83 |
| | 2 | 42155 | 1374 | 1398 | 9.83 |
| | 3 | 40936 | 1340 | 1364 | 9.22 |
| 15 △3 7 | 1 | | | | △1 5 |
| | 2 | | | | △1 5 |
| | 3 | | | | |
| 16 | 1 | 54745 | 1716 | 1740 | 16.19 |
| | 2 | 55355 | 1732 | 1756 | 16.08 |
| | 3 | 54136 | 1699 | 1724 | 14.58 |
| 17 | 1 | 56545 | 1765 | 1789 | 4.17 |
| | 2 | 57155 | 1785 | 1872 | 4.19 |
| | 3 | | | | |

| LIST OF DOCKING PLUGS IN SHELL ● | | | | | |
|---|---|---|---|---|---|
| NO. | SIDE | FWD OR AFT | FRAME | FWD OF AFT REF POINT | DIST OFF CL SHIP |
| 1 | STBD | FWD | 82 | 11519mm | 150mm |
| 2 | STBD | FWD | 82 | 11770mm | 360mm |
| 3 | STBD | FWD | 79 | 13693mm | 1316mm |
| 4 | PORT | FWD | 79 | 13693mm | 1291mm |
| 5 | STBD | FWD | 72 | 17535mm | 1258mm |
| 6 | PORT | FWD | 73 | 17242mm | 1217mm |
| 7 | STBD | FWD | 49 | 31467mm | 2765mm |
| 8 | PORT | FWD | 49 | 31467mm | 2765mm |
| 9 | STBD | FWD | 48 | 32109mm | 300mm |
| 10 | PORT | FWD | 47 | 32697mm | 2790mm |
| 11 | STBD | FWD | 47 | 32702mm | 2790mm |
| 12 | PORT | FWD | 39 | 37512mm | 2900mm |
| 13 | STBD | FWD | 39 | 37512mm | 2810mm |
| 14 | STBD | FWD | 34 | 40500mm | 315mm |
| 15 | PORT | FWD | 29 | 43422mm | 2740mm |
| 16 | STBD | FWD | 29 | 43397mm | 2650mm |
| 17 | PORT | FWD | 20 | 48748mm | 160mm |
| 18 | STBD | FWD | 20 | 48748mm | 170mm |
| 19 | STBD | FWD | 19 | 49387mm | 765mm |
| 20 | PORT | FWD | 13 | 52944mm | 135mm |
| 21 | STBD | FWD | 13 | 52944mm | 135mm |
| 22 | STBD | FWD | 7 | 56479mm | 120mm |

| LIST OF DRAIN PLUGS IN SHELL ● | | | | | |
|---|---|---|---|---|---|
| NO | SIDE | FWD OR AFT | FRAME | FWD OF AFT REF POINT | DIST OFF CL SHIP |
| 1 | S | FWD | 88 | 8300mm | 480mm |

| LIST OF OPENINGS IN SHELL BELOW DWL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | SERVICE | SIZE OF PENETRATION | SIDE | FWD OR AFT | FRAME | FWD OF AFT REF POINT | DISTANCE OFF CL SHIP | HEIGHT ABV KEEL BOTTOM | REFERENCE |
| 1 | SCIENTIFIC SEAWATER DISCHARGE | 150mm DIA | S | 124 FWD | 12 | 53526mm | 2259mm | 2966mm | |
| 2 | SCIENTIFIC SEAWATER DISCHARGE | 150mm DIA | S | 124 FWD | 12 | 53526mm | 300mm | 0mm | |
| 3 | AUX. S.W. COOLING DISCHARGE | 150mm DIA | P | 250 FWD | 57 | 26652mm | 6431mm | 5290mm | |
| 4 | MAIN SEAWATER DISCHARGE | 170mm DIA | P/S | 410 FWD | 72 | 17812mm | 6123mm | 5662mm | |
| 5 | SEACHEST SUCTION | 925x520 | P/S | 284 FWD | 18 | 50086mm | 2766mm | 1735mm | |
| 6 | SEACHEST SUCTION | 925x520 | P/S | 891 FWD | 18 | 50693mm | 2766mm | 1719mm | |
| 7 | SEACHEST SUCTION | 925x520 | P/S | 1498 FWD | 18 | 51300mm | 2964mm | 1702mm | |
| 8 | SEACHEST SUCTION | 925x520 | P/S | 2105 FWD | 18 | 51907mm | 2964mm | 1686mm | |

DWG NO. M282–085–FA04 SH 6

| HULL NO | CAGE CODE | SIZE | JOB NO. | ITEM | DELIVERABLE | SHEET | REV |
|---|---|---|---|---|---|---|---|
| 1953 | 3B213 | D | M282 | 085 | FA04 | 006 | 09 |
| ESTIMATE NO | SCALE | | FILE R:\M282\FUNCTIONALDESIGN\INWORK\HULLDWG | | | SHEET 6 OF 6 | |
| 00–104 | NONE | | | | | | |

PLOT: 1=1